

Mississippi Trawl Gear Characterization

Prepared by Office of Marine Fisheries, Mississippi Department of Marine Resources, 1141 Bayview Avenue, Biloxi, MS 39530

Shrimp Fishery Characterization

Gear Types

Shrimp are caught in Mississippi waters using the following gear types, all of which may have some potential for interaction with marine turtles.

Trawls

- a. Otter Trawl- bottom shrimp
- b. Skimmer Trawl

Trawls

- a. Otter Trawl – Bottom Shrimp

The basic otter trawl (Figure 3) is the most common type of trawl used in Mississippi waters to harvest shrimp. The otter trawl is constructed of twine webbing that when fully deployed makes a cone shape. Floats on the head-rope (top line) and chains on the foot rope (bottom line) of are used to open the mouth of the trawl vertically. To spread the mouth of the trawl open as large as possible, each side (wing) is attached to trawl doors

that have chains attached to the tow cable and then to the vessel.

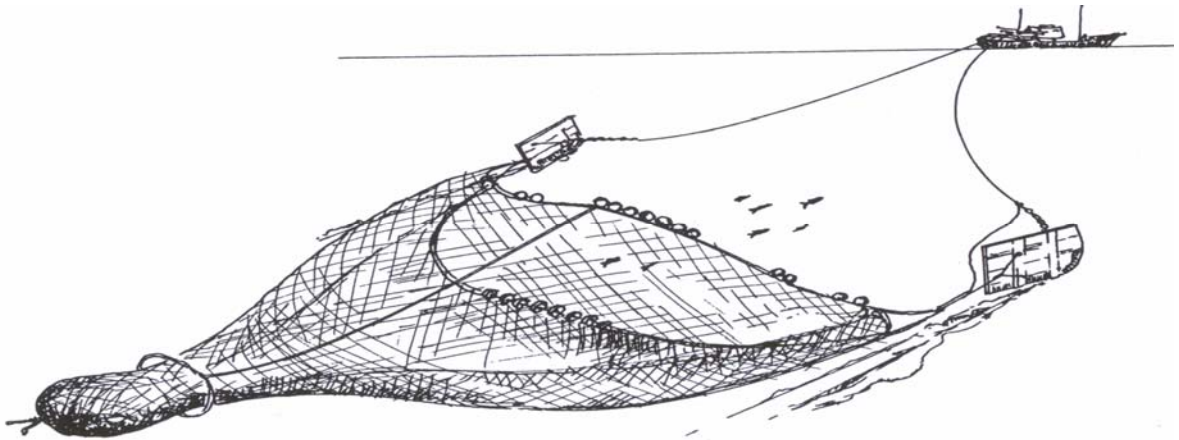


Figure 3 Otter Trawl

The otter trawl is deployed overboard followed by the tickler chain and set of doors. Water resistance forces the doors to spread and open the webbing. Tow lines are then released until the desired length (depth of water) is achieved. This process must then be reversed to retrieve the trawl.

Among the various types of fisheries and associated gear types that are commonly used in Mississippi waters, the trawl fishery is the most likely to interact with and have an impact on sea turtles. With the exception of the butterfish trawl fishery, trawls are almost exclusively employed for the catching of various species of shrimp.

Finfish bycatch in the otter trawl fishery primarily consists of whiting (*Menticirrhus sp.*), flounder (*Paralichthys sp.*) and a variety of ground fish which are harvested and sold as bycatch product of the shrimp industry (Figure 4). These vessels are required to have both a shrimp vessel license and a fishing boat license in order to sell the finfish they catch while trawling for shrimp.

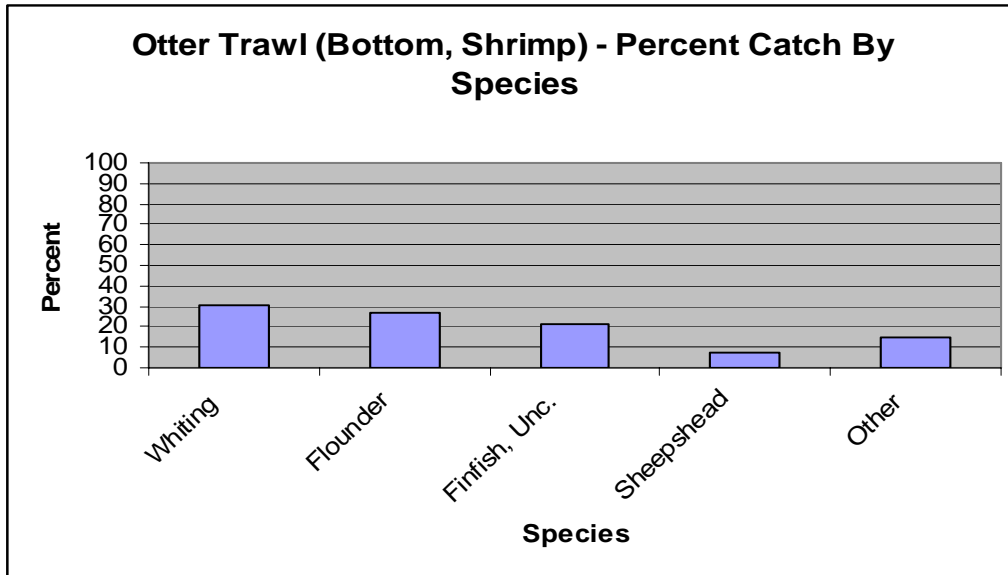


Figure 4 Otter Trawl Percent Catch by Species 1999-2003 (NMFS)

b. Skimmer Trawl – Bottom Shrimp

The use of the skimmer trawl (Figure 5) has gained in popularity over the last ten years as it is an effective gear type in the relatively shallow waters of the Mississippi Sound. A skimmer trawl extends from the outrigger of a vessel with a cable and a lead weight which hold the trawl mouth open instead of floats and chains. "Skimmers", as they are called locally, are only used in shallow waters because of the way they are constructed.

The skimmer trawl is held in place by the frame on three sides and mounted on the vessel just behind the bow. The skimmer trawls are pushed through the water instead of towed behind the vessel like otter trawls. The frame is rigid enough to keep the net on the bottom but flexible enough to glide over obstacles along the bottom. This allows the skimmer vessel to continue to move while the cod end of the trawls is retrieved and emptied. This may be done as often as every 30 minutes. The NMFS does not require skimmer a trawl to have a TED because the nets can be emptied frequently while continuing to fish this reduces the chance of drowning a captured sea turtle. Otter trawls are required

to use a TED because they are generally towed for several hours before the nets is emptied this increase the chance of drowning a captured sea turtle.

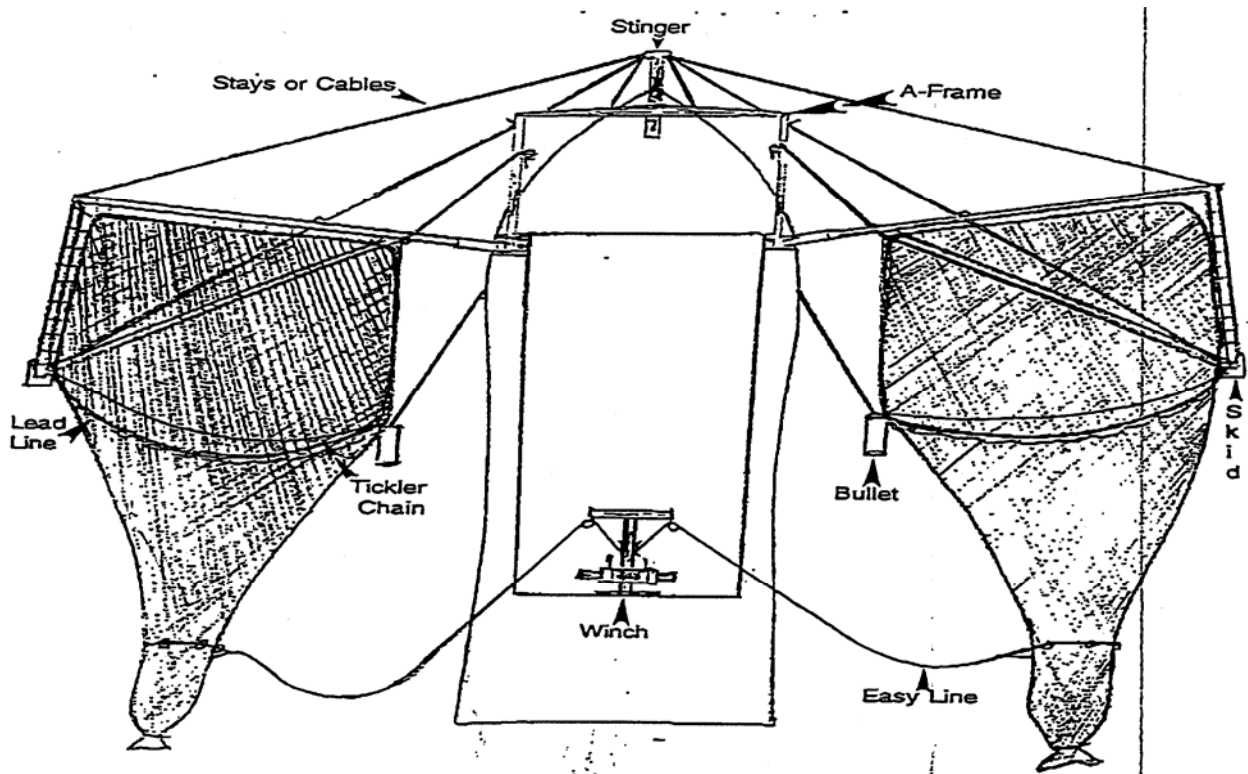


Figure 5 Skimmer Trawl

Management

Ordinance 2 - regulations for the shrimp fishery in Mississippi

Section 1.

Footrope shall mean lead line, foot line, ground rope or that lower part of the trawl that the webbing is first attached, that also provides for the weighing down of the trawl by means of lead weights, chain or other means.

Headrope shall mean cork line, headline, float line or that upper part of the trawl that the webbing is first attached, that also provides flotation by means of corks, floats or other means.

Saltbox shall mean any container or similar device in which the salinity is greater than one hundred (100) parts per thousand and is used to aid in separating the shrimp from the bycatch.

Skimmer Trawl shall mean a trawl that extends from the outrigger of a vessel with a cable and a lead weight holding the trawl mouth open.

Section 3.

Except for a test or try trawl, it shall be unlawful for any boat or vessel to use more than two (2) trawls provided that when two (2) trawls are used such trawls shall not exceed a length of twenty-five (25) feet on the headrope and thirty-two (32) feet on the footrope for each trawl and the trawl doors shall not exceed six (6) feet in length and thirty-four (34") inches in height when employed in the waters under the territorial jurisdiction of the State of Mississippi (Figure 7).

Section 4.

It shall be unlawful for any person, firm, or corporation to use any single trawl for the catching or taking of shrimp in the waters under the territorial jurisdiction of the State of Mississippi with a measurement of more than fifty (50) feet along the headrope or more than sixty (60) feet along the footrope, continuous

measurement. Mississippi does not have a mesh size requirement for otter trawls.

Section 5.

It shall be unlawful for any person, firm or corporation to use skimmer trawls, wing nets (butterfly nets), Siamese trawls or any like contrivance which is in excess of twenty-five (25) feet on the headrope and thirty-two (32) feet on the footrope for each trawl when employed in the waters under the territorial jurisdiction of the State of Mississippi. Mississippi does not have a mesh size requirement for skimmer trawls.

Section 8.

It shall be unlawful for any person, firm or corporation to use any test or try trawl for the catching or taking of shrimp in the waters under the territorial jurisdiction of the State of Mississippi with a measurement of more than twelve (12) feet along the headrope or more than fifteen (15) feet along the footrope, or used with boards or doors more than thirty (30) inches in length.

Section 10.

It shall be unlawful for any person, firm, or corporation to wash, drag, or pull a trawl or try net on top of the water or under the water with the bag tied or untied in any area of the territorial waters of the State of Mississippi which are closed to shrimping.

Further, it shall be unlawful for any person, firm, or corporation to wash, drag, or pull double or multiple rigs on top of the water or under the water with the bags tied or untied in any area of the territorial waters of the State of Mississippi which are closed to the use of double rigs, or in waters which are closed to the use of that size, type or number of rigs.

Licensed shrimp vessels may keep in whole, for personal consumption only the following types of fish which are caught in the shrimp nets or trawls of the vessel: white trout; croaker, black drum, and ground mullet (Family Sciaenidae); sheepshead (Family Sparidae); gafftopsail catfish (Family Ariidae); and flounder (Family Bothidae and Family Pleuronectidae). The cumulative total of fish shall not exceed twenty-five (25) pounds. In addition, a vessel may keep three (3) dozen blue crabs (portunidae family). This exemption for personal consumption does not apply to fish or crabs that are otherwise illegal to possess or catch.

Mississippi's shrimp fishery has long played an integral role in the State's seafood industry (Figure 6). With a combination of influences including dockside gaming, an increase in the coastal population and associated increased demands for waterfront properties and fresh seafood, the shrimping industry has had to adjust to many regulatory changes in order to survive, but it remains today



Figure 6 Workers Process Shrimp in a Local Plant

as the most valuable of all the state's marine fisheries. All waters one-half mile due South of the shoreline are permanently closed to commercial and recreational shrimp trawl harvest (Figure 7).

From 1999-2003 annual shrimp harvest in Mississippi averaged approximately 16

million pounds (heads-on) with a dockside value of 31 million dollars

(Figure 8). Brown shrimp comprise roughly 70% of the total shrimp landings in the state.

The Mississippi shrimp industry employs many people in the coastal counties including harvesters, dealers, processors, shippers and related businesses. Some 1,602 commercial and recreational shrimp licenses (Figure 9) were sold during the 2003-2004 (May 1 – April 30) license year to harvesters and an

additional 100 licenses or so are sold annually to seafood dealers and/or processors.

Mississippi does not have shrimp effort data consequently there cannot be evaluations made of the otter trawl fishery compared to the skimmer trawl fishery. The commercial shrimp fishery ranks first in total dockside value and second in total landings among all seafood harvested in Mississippi (Figure 10).

There is no state sponsored sea turtle observer program for this fishery.

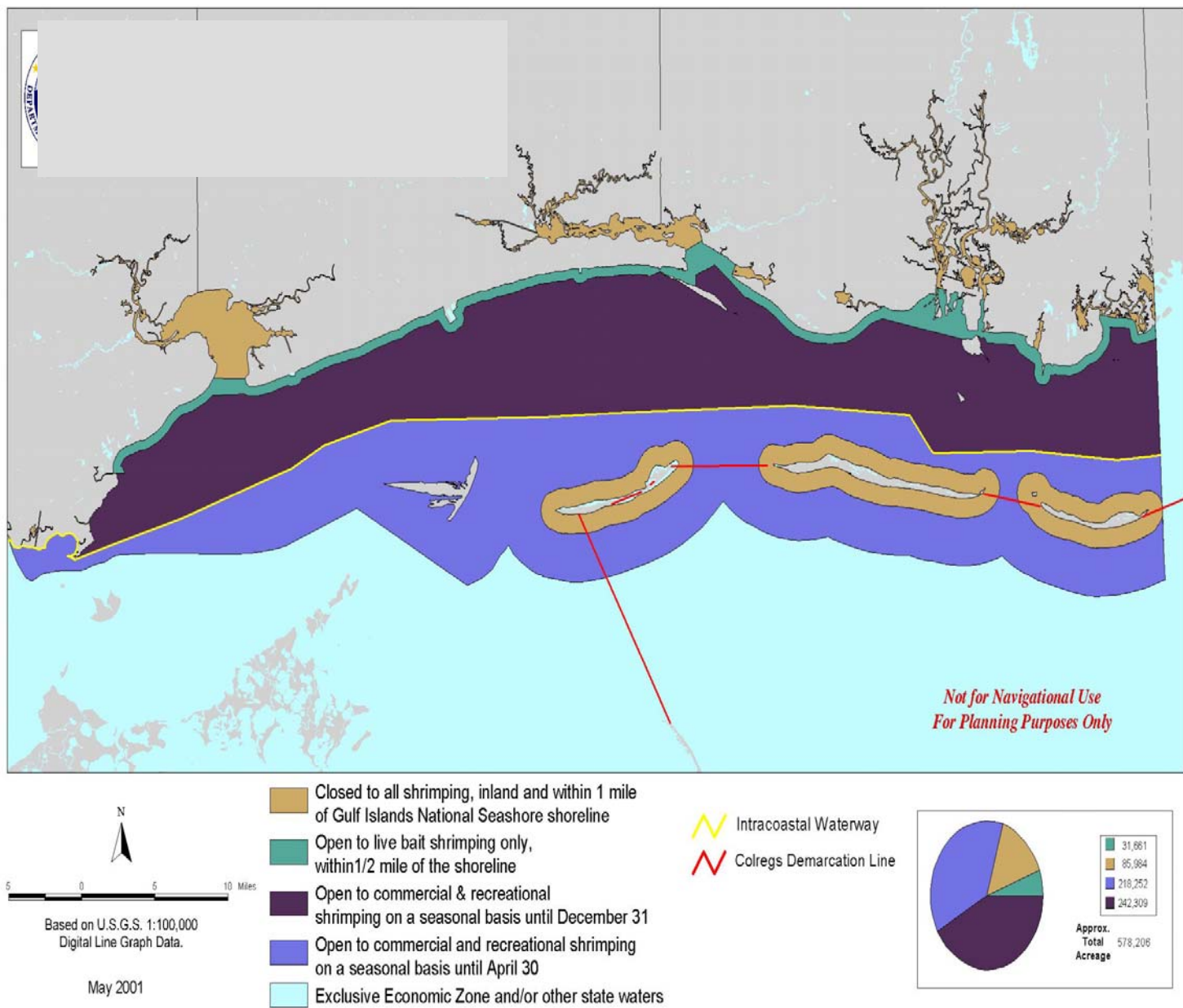


Figure 7 Mississippi Near shore and Territorial Sea Shrimping Grounds

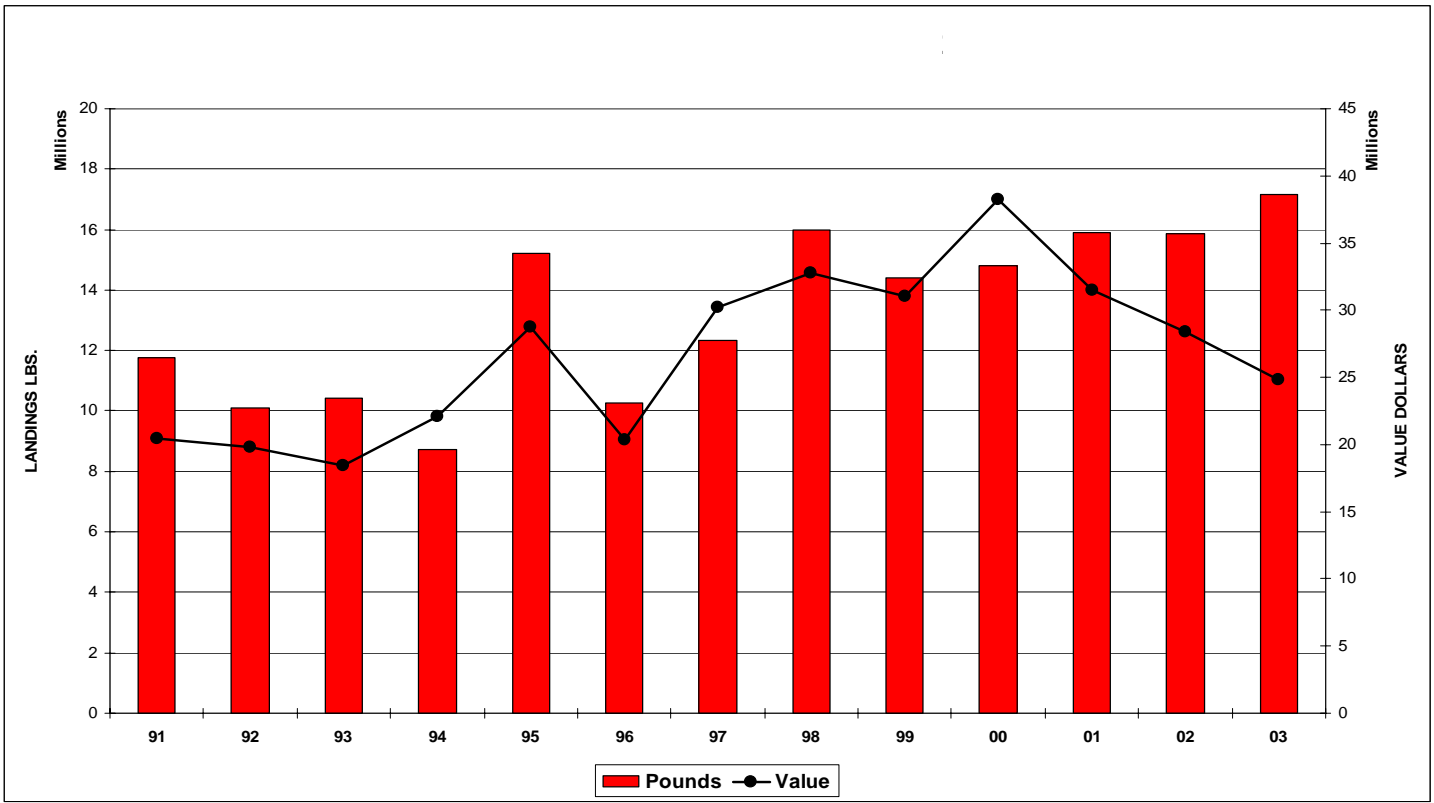


Figure 8 Mississippi Shrimp Landings and Value (NMFS)

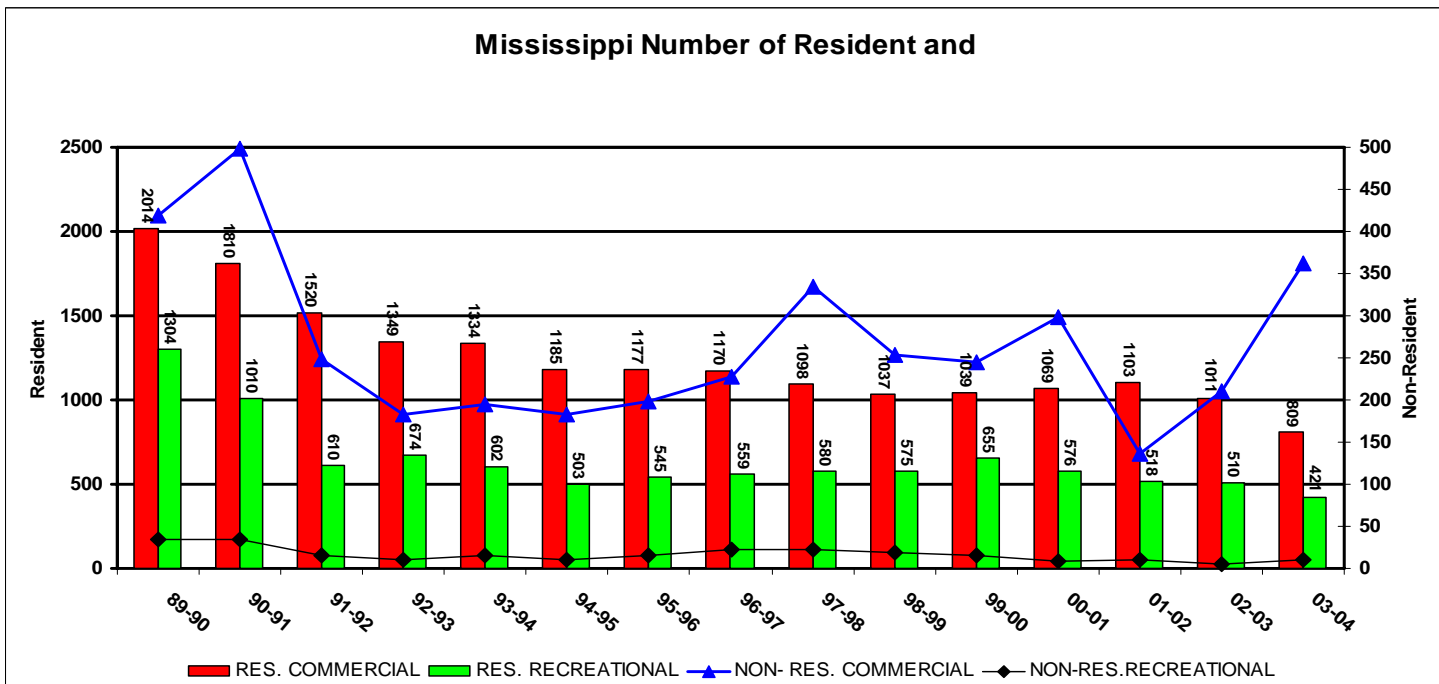


Figure 9 Mississippi Resident and Non-Resident Shrimp Licenses (MDMR)

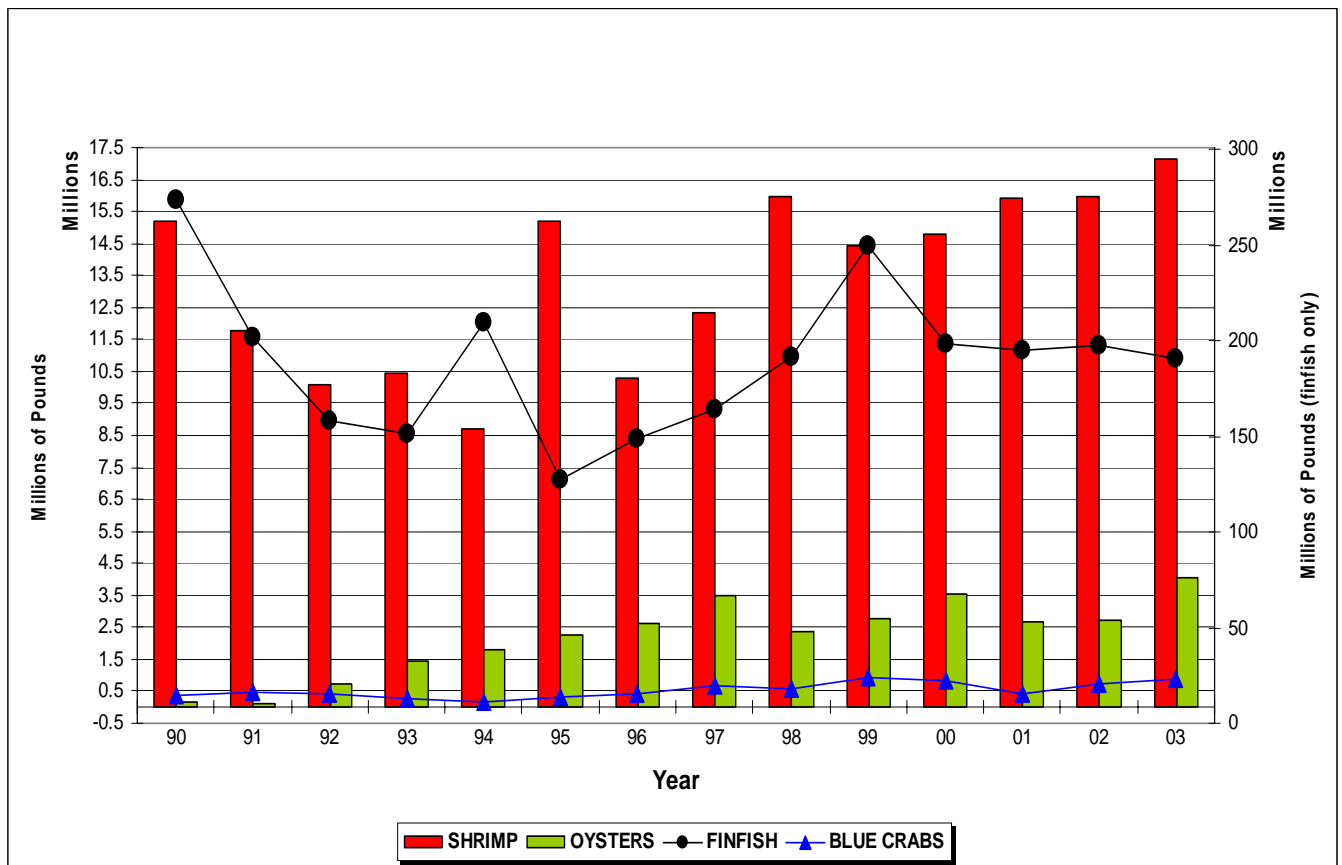


Figure 10 Mississippi Seafood Landings (NMFS)

Turtle Excluder Devices

A Turtle Excluder Device (TED) is a piece of equipment sewn into a shrimp trawl to allow sea turtles to escape from the fishing gear (Figure 11). On June 27, 1987 TED's were required to be used by all shrimp trawlers fishing in the EEZ and later became mandatory in each states territorial shrimping waters on December 4, 1992. Additionally, in 1989 the "shrimp-turtle law" was passed requiring all countries exporting shrimp to the United States to use TED's. In 2003 NMFS increased the size of the TED opening's to allow for larger adult turtles to escape. Mississippi requires all trawlers using any mechanical method

of retrieval to use TEDs. Shrimp trawler means any vessel that is equipped with one or more trawl nets and is capable of, or used for, fishing for shrimp, or whose on-board or landed catch of shrimp is more than 1 percent, by weight, of all fish comprising its on-board catch or landed catch. Any vessel trawling for species other than shrimp are not required to use a TED in Mississippi waters.

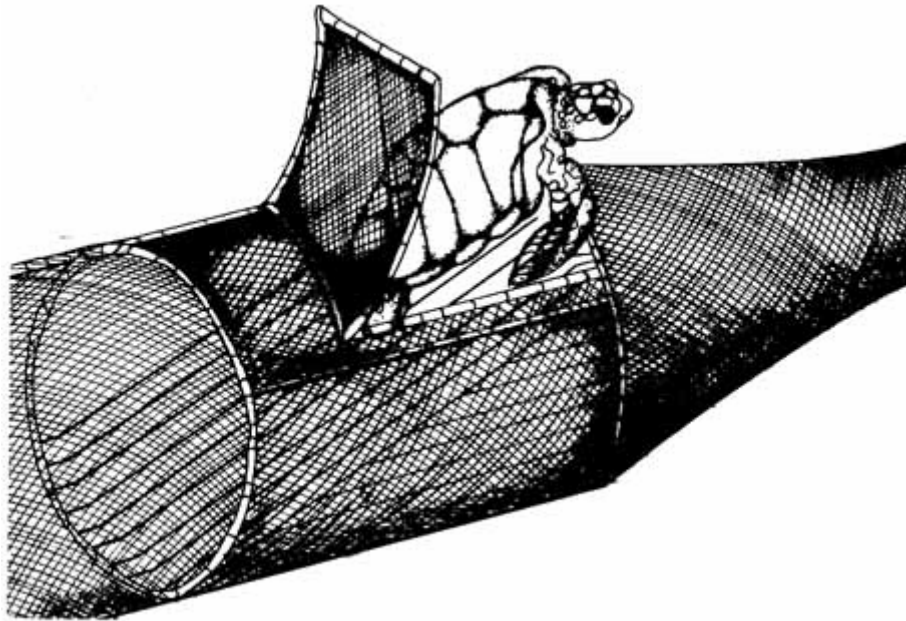


Figure 11 Turtle Excluder Device (TED) with Escaping Sea Turtle

Bycatch is generally defined to include all species of marine life which are captured in a shrimp trawl other than shrimp. Because of the significant numbers of species taken incidental to the shrimp fishery, the bycatch issue has become very controversial in recent years particularly with respect to threatened and endangered sea turtles and juvenile red snapper (*Lutjanus campechanus*). The incidental catch of these two species has prompted some major changes in the way that the traditional shrimp fishery has been conducted in the United States.

Blue Crab Fishery Characterization

Blue crabs are also harvested in Mississippi waters using trawl gear, in addition to crab pots. The below discussion only includes information on the trawl portion of the fishery.



Figure 12 Blue Crabs

Trawls

1. Otter Trawl- bottom shrimp

The otter trawl is constructed of twine webbing so that when fully deployed makes a cone shape. Floats on the head-rope (top line) and chains on the foot rope (bottom line) of are used to vertically open the mouth of the trawl. There is a maximum length of 50 feet on the head-rope for vessels using a single trawl and a maximum head-rope length of 25 feet for vessels using two trawls. To spread the mouth of the trawl open as large as possible, each side (wing) is attached to a trawl doors that have chains attached to the tow cable and then to the vessel. The otter trawl is deployed overboard followed by the tickler chain and set of doors. Water resistance forces the doors to spread and open the trawl mouth.

Tow lines are released until the desired length (depth of water) is achieved. This process must then be reversed to retrieve the trawl. The otter trawl can be used to harvest blue crabs in addition to the target species of shrimp. Mississippi does not have a mesh size requirement for otter trawls. These trawls are required to use TED's.

2. Otter Trawl – bottom blue crabs

The blue crab trawl fishery is conducted only in the winter months around Cat Island, a barrier island located in the western Mississippi Sound. The fishers are targeting primarily female blue crabs that over-winter during the cold months in this area. The otter trawl is constructed of twine webbing so that when fully deployed makes a cone shape. Floats on the head-rope (top line) and chains on the foot rope (bottom line) of are used to open the mouth of the trawl vertically. There is a maximum length of 50 feet on the head-rope for vessels using a single trawl and a maximum head-rope length of 25 feet for vessels using two trawls. To spread the mouth of the trawl open as large as possible, each side (wing) is attached to a trawl door that has chains attached to the tow cable and then to the vessel. Otter trawls used for the blue crab trawl fishery are modified by using a heavier a tickler chain and heavier sets of doors than are used in the shrimp fishery. Water resistance forces the doors to spread and open the webbing. Tow lines are then released until the desired length (depth of water) is achieved. This process must then be reversed to retrieve the trawl. The TED requirement does not apply to these trawls because the catch is less than 1% shrimp.

Management

The Blue Crab, *Callinectes sapidus*, is distributed throughout the shallower waters of the Gulf of Mexico; and in Mississippi waters throughout Mississippi Sound and adjacent bays and bayous.

The Mississippi Department of Marine Resources (MDMR) is charged with the responsibility of managing the blue crab fishery in its jurisdiction. Mississippi does not have an observer program for the blue crab fishery.

In the past, management decisions issued by the MDMR have focused on the protection of sponge crabs (gravid female blue crabs). The harvesting of sponge crabs from Mississippi waters was totally banned from 1963 to 1974. Between 1974 and 1981 selected areas were opened or closed to sponge crab harvest. In 1979 a sponge crab sanctuary area was designated in the eastern part of the Mississippi Sound. Currently, fishermen may not harvest sponge crabs in Mississippi waters or any crab smaller than five inches. Entry into the blue crab fishery is regulated by the MDMR through the issuance of commercial crabbing licenses. Before 1979 only those crabbers using pots had to purchase a crabbing license. Both trawlers and crab-pot fishermen must obtain a harvest license. Beginning in the 02-03 license year recreational crab trap fishers were required to purchase a license, prior to that recreational crab fishers were not required to have a license.

Mississippi crab license sales have increased only slightly in recent years as shown in (Figure 14)..

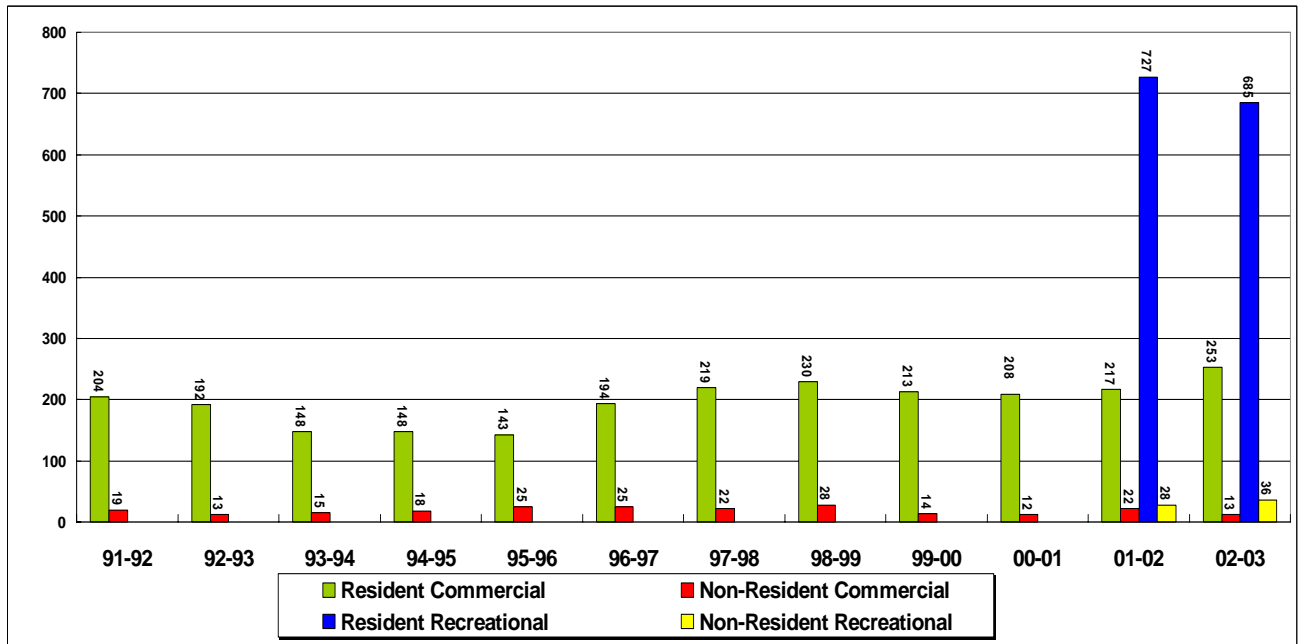


Figure 14 Mississippi Blue Crab License Sales

Mississippi does not have effort data for the blue crab fishery. Landings rebounded from a low of 433,000 pounds to almost 870,000 pounds in 2003 (Figure 15).

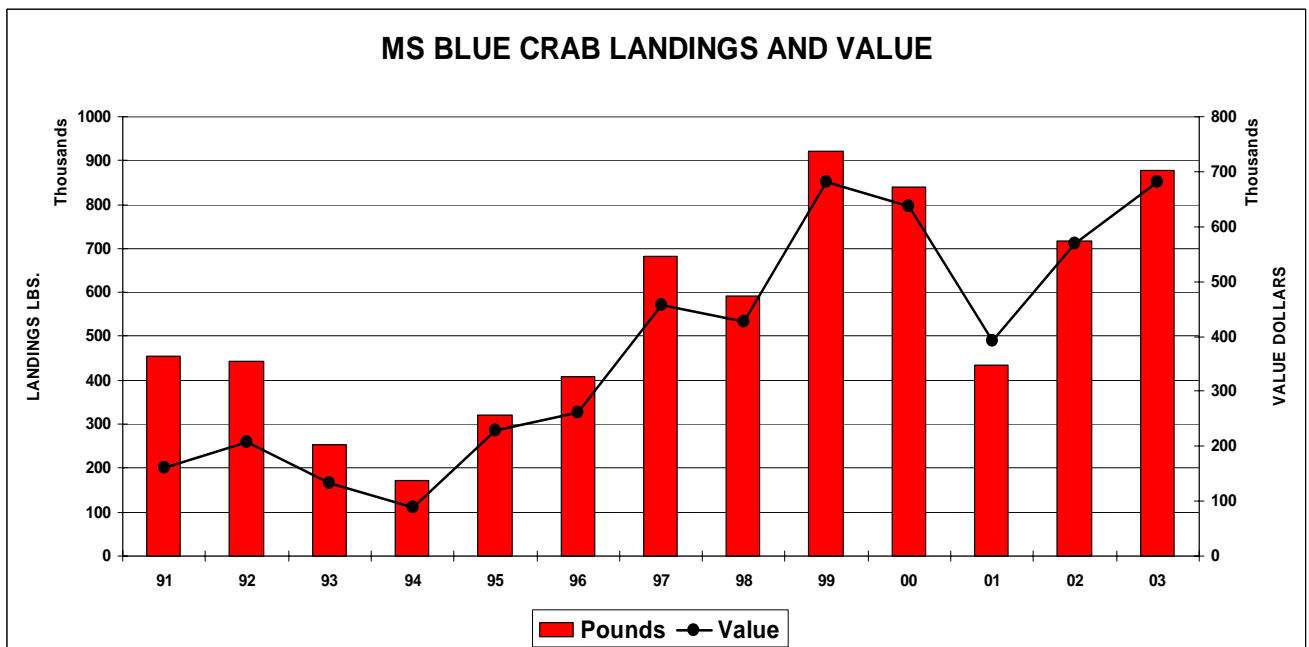


Figure 15 Mississippi Blue Crab Landings and Value (NMFS)

Crabs can be caught year round in Mississippi, but become less active when water temperature dips below 50°-55° F. As the water temperatures begin to rise in March and April, catch rates increase rapidly. The best time of year to harvest large crabs is usually from October to December. Mature females prefer the higher salinity waters found around Mississippi barrier islands, but large males prefer the lower salinity waters of the rivers and bayous.

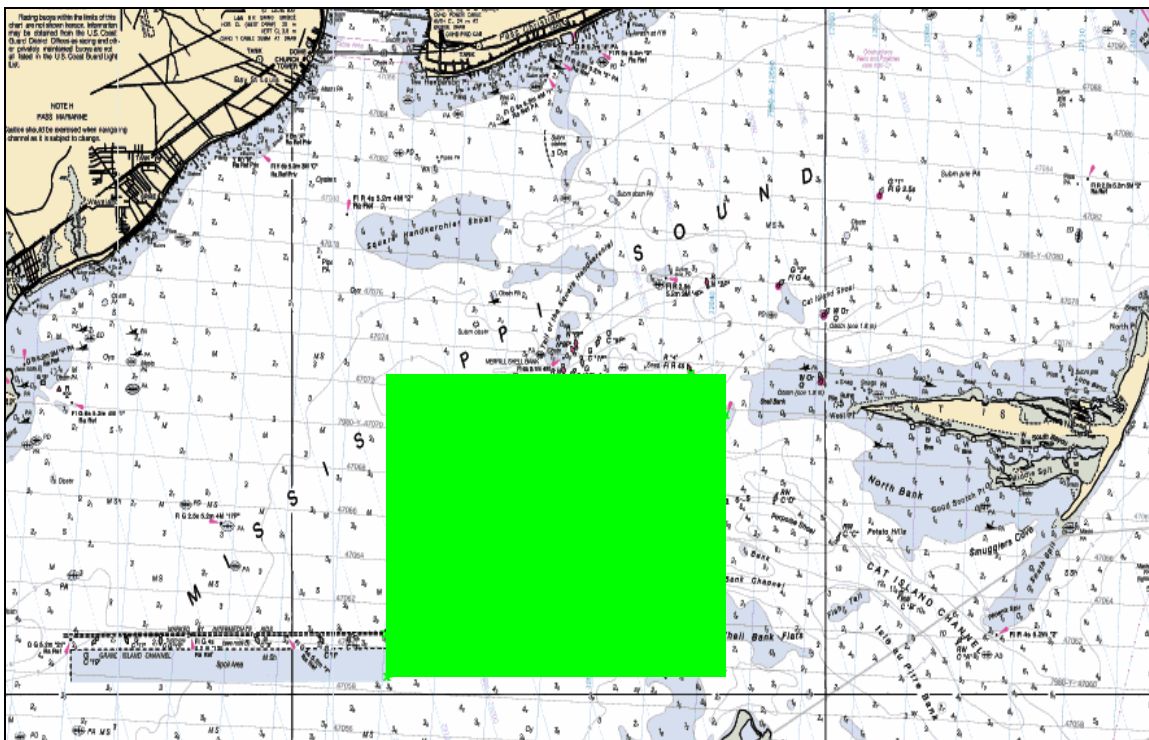


Figure 16 BlueCrab Sanctuary

Finfish Fishery Characterization

Finfish in Mississippi are targeted with several gear types (e.g., seines, entanglement gear) but the following discussion only includes information on trawl fisheries for finfish. The State of Mississippi does not license specific gear types for the harvest of finfish except for menhaden purse seines. Fishermen using seines, trawls, gill and trammel nets, and cast nets have to buy a Fishing Boat License. These licenses do not differentiate the gear the fishermen uses to catch the seafood. Most coastal states are collecting effort information through a trip-ticket program. The oyster fishery is the only fishery with effort data collected by the State of Mississippi. This data is collected through a state sponsored trip-ticket program.

Trawls

1. Trawl bottom, fish

Offshore fish trawls as large as ninety feet are utilized in the butterfish (*Peprilus burti*) industry. These trawls are fished offshore in the EEZ (Exclusive Economic Zone) in water depths of 20 to 50 fathoms. No effort information for this gear is available. Because only one dealer is involved information about catch is confidential.

2. Trawl bottom, paired

Paired trawls (large trawls pulled between two separate vessels) were used primarily in the mullet fishery and have not been utilized since 2000-2001. Although paired trawls are not prohibited in state waters, the individual who was instrumental in employing this gear moved into another fishery. No effort information for this gear is available. Because only one dealer is involved information about catch is confidential.

There is no state sponsored sea turtle observation program for trawls in the State of Mississippi.

Summary

In general, participation in Mississippi's commercial fisheries, based on numbers of licenses sold, has not grown in proportion to the general population growth experienced along the Mississippi Gulf Coast. The numbers of licensed recreational fishermen, on the other hand, have increased by a proportionately greater percentage. Still, the overall effects of these fisheries, both recreational and commercial, on populations of marine turtles in Mississippi waters as judged by the numbers of reported sea turtle strandings have remained relatively stable following a sharp drop from 66 in 1998 to 33 in 1999.

As a result of this study and a review of the Sea Turtle Strandings Network in Mississippi has revealed a number of opportunities for significant improvement in both reporting and documentation of sea turtle strandings in this state. The Department of Marine Resources intends to further identify specific potential enhancements to this program, develop a plan for implementing them and seek out and pursue federal and state funding to initiate these changes.